NON-PUBLIC?: N
ACCESSION #: 9007160378
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Callaway Plant Unit 1 PAGE: 1 OF 06

DOCKET NUMBER: 05000483

TITLE: Two Reactor Trips Due To Failed Input Buffer Card and Faulty Slave Cycler Counter Card and Missed Surveillance due to Cognitive Personnel Error
EVENT DATE: 06/11/90 LER #: 90-007-00 REPORT DATE: 07/10/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(i) and 50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: T. P. Sharkey, Supervising Engineer TELEPHONE: (314) 676-8336
SIte Licensing

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: AB COMPONENT: CAP MANUFACTURER: C560
X AA CTR W351
REPORTABLE NPRDS: N
N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 6/11/90, at 1016 CDT, a Reactor Protection System (RPS) reactor trips a Feedwater Isolation (FWIS), and an Auxiliary Feedwater Actuation occurred following simulatenous closure of all four Main Steam Isolation Valves (MSIVs). The plant was in Mode 1 - Power Operations at 100 percent reactor power. The MSIVs closed due to a failed input buffer card in the MSIV manual fast close circuitry in the Main Steam and Feedwater Isolation System control cabinet. The failed input buffer card was replaced.

On 6/12/90, at 0501 CDT, while subcritical during reactor startup, four Bank 'B' Rod Control Cluster Assemblies dropped. Options were evaluated

and at 0545, the reactor trip breakers were opened, manually tripping the reactor. A FWIS was received as anticipated. The plant was in Mode 2 - Startup (subcritical). A faulty rod control slave cycler counter card for the 1BD control rod power cabinet was identified and replaced.

During startup of the plant on 6/12/90, Operations Surveillance Procedure, "Main Turbine Trip Tests" (OSP-AC-00004), was not performed. This event was discovered on 6/18/90. The plant was in Mode 2 - Startup at 15 percent reactor power. This event was caused by the Shift Technical Advisor mistakenly reading the surveillance schedule book. OSP-AC-00004 was performed satisfactorily on 6/18/90. Notes were added to the surveillance schedule book to provide clarity. Individuals involved will be counseled.

END OF ABSTRACT

Basis for Reportability

Event One:

On 6/11/90, at 1016 CDT, a Reactor Protection System (RPS)(1)_/ reactor trip occurred following the simultaneous closure of all four Main Steam Isolation Valves (MSIVs)(2)_/. As a result of the RPS actuation, a Feedwater Isolation (FWIS) and an Auxiliary Feedwater Actuation (AFAS) were generated by design. Since the Engineering Safety Features (ESF)(3)_/ actuations were not part of a preplanned sequence during reactor operation or testing, this event is reportable per 10CFR50.73(a)(2)(iv).

Event Two:

On 6/12/90 at 0501 CDT, while subcritical during reactor startup (from Event One), four Bank 'B' Rod Control Cluster Assemblies (RCCA)(4)_/ dropped. Following evaluation of the options available, it was determined that a manual trip should be initiated. At 0545, the reactor trip breakers(5)_/ were opened, manually tripping the reactor. A FWIS was received as anticipated. This event is reportable per 10CFR50.73(a)(2)(iv).

Event Three:

Technical Specification (T/S) 4.3.4.2 requires that the Turbine Overspeed Protection System shall be maintained, calibrated, tested and inspected in accordance with the Callaway Plant's Turbine Overspeed Protection

Reliability Program (TOPRP). Adherence to this program shall demonstrate OPERABILITY of the system.

During the startup of the plant on 6/12/90, Operations Surveillance Procedure, "Main Turbine Trip Tests" (OSP-AC-00004), was not performed as required by the TOPRP. This event was discovered on 6/18/90 and is reportable per 10CFR50.73(a)(2)(i)(B) as a condition prohibited by the plant's T/S.

Plant Conditions at Time of Event

Event One:

Mode 1 - Power Operations
100 percent Reactor Power
Reactor Coolant System (RCS): Temperature (average) - 558 degrees F; Pressure - 2291 psig

Event Two:

Mode 2 - Startup (subcritical)

Event Three:

Mode 2 - Startup, Reactor Power 15%

Description of Event

Event One:

At 1016 on 6/11/90, the 'Main Steam/Main Feed Valves Not Full Open' Main Control Board (MCB) annunciator(6)_/ came in as all four Main Steam Isolation Valves (MSIVs) simultaneously closed. Eight seconds later, the reactor tripped on "High Pressurizer Pressure". The emergency procedures were followed as required to immediately stabilize the plant. FWIS and AFAS ESF actuations were received per design.

Event Two:

Following investigation and determination of root cause for Event One, reactor startup commenced at 0443 on 6/12/90. At 0501, while subcritical during reactor startup, four Bank 'B' RCCA's dropped (F2, B2, K14 & P6). RCCA K14 did not fully insert, but stopped within six steps of the bottom. Bank 'B' was at approximately 130 steps when the rods dropped.

RCCA K14 fully inserted when the licensed Reactor Operator began manually inserting control rods. The 'Control Rod Urgent Failure' MCB annunciator was received when the control rods were manually inserted approximately 15 to 20 steps. Utility reactor engineers and Instrumentation and Control technicians were dispatched to the control rod cabinets(7)_/ to investigate.

Following evaluation of the options available, it was determined by the licensed operators and plant management that a manual reactor trip should be initiated. Preparations were made for the manual trip (i.e. valve lineups for the anticipated FWIS and voltage readings on the reactor trip breakers). At 0545, the reactor trip breakers were opened, manually tripping the reactor.

Event Three:

On 6-12-90 at approximately 1800, a reactor startup commenced. At 1943, the PM Shift (1500 - 2300) licensed Shift Supervisor (SS) proceeded with reactor startup without completion of procedure OSP-AC-00004, Main Turbine Trip Tests. The main generator breakers(8)_/ were closed at 2200.

At 0300 on 6-13-90, the non-licensed Shift Technical Advisor (STA) reviewed startup documentation. He concluded that OSP-AC-00004 had been performed within the last seven days and thus was not required during this startup. The STA's determination was reviewed and accepted by the SS. On 6/18/90 during a review of surveillance task sheets, the surveillance tracking non-licensed engineer discovered that the OSP-AC-00004 surveillance had not been performed.

Root Cause

Event One:

The MSIVs closed due to a failed input buffer card(9)_/ in the MSIV manual fast close circuitry in the Main Steam and Feedwater Isolation System (MSFIS)(10)_/ control cabinet. The input buffer card had a capacitor momentarily short to ground. Consolidated Controls Corporation (CCC), manufacturer of the input buffer card, determined that a certain brand of capacitor (AVX) used in the input section of the input buffer card exhibited a higher failure rate than other brands specified for this application. The use of AVX capacitors on the input buffer card was discontinued in 1981.

Event Two:

Subsequent troubleshooting of the control rod system identified a faulty slave cycler counter card(11)_/ (Model No. 3360C94G01) for the 1BD control rod power cabinet. This resulted in the four Bank 'B' RCCA's dropping, RCCA K14 relatch prior to full insertion, and the Control Rod Urgent Failure annunciator during the manual insertion.

Event Three:

The STA mistakenly read the surveillance schedule.

Corrective Actions

Event One:

The failed input buffer card in the MSIV manual fast close MSFIS circuitry was replaced. A subsequent evaluation was performed to determine how many input buffer cards (installed and spares) use the AVX capacitors. The evaluation determined that only the MSFIS cabinets have boards with the AVX capacitors. All of the AVX capacitors on the MSFIS input buffer cards will be replaced with another qualified, more reliable capacitor.

Event Two:

The faulty slave cycler counter card for the 1BD control rod power cabinet was replaced. An evaluation is being performed to determine the benefits of testing and/or replacing similar cards in the control rod system.

Corrective Actions (continued)

Event Three:

Surveillance Procedure OSP-AC-00004 was performed satisfactorily on 6/18/90 to satisfy T/S 4.3.4.2.

Notes were added to the surveillance schedule book to clarify the requirements for performing surveillance test OSP-AC-00004.

Surveillance procedure and scheduling documents are also being evaluated for clarification.

The individuals involved will be counseled and the Operations Department and Independent Safety Engineering Group will receive training on this event.

Safety Significance

The ESF systems involved in Event One and Event Two performed as required. For Event Two, the reactor was subcritical with sufficient shutdown margin available with the shutdown control rods before the manual reactor trip was initiated. There was no detrimental effect on plant equipment as a result of the actuations. OSP-AC-00004 was performed satisfactorily on 6/18/90 for Event Three. All equipment functioned as required by plant design. None of the events posed a threat to the health and safety of the public

Previous Occurrences

Event One:

LER 85-052-00, transmitted on 1/8/86, via ULNRC-1235.
This LER detailed a reactor trip on low steam generator water level due to closure of the Main Feedwater Isolation Valves (MFIV)(12)_/. The low steam generator level was a result of the MFIVs closing due to a failed input buffer card. The card was replaced. Evaluation at that time determined that there was not a significant generic failure mode, so no additional actions were taken.

Although LER 85-052-00 and LER 90-007-00 are similar in that each detail a reactor trip caused by a failed input buffer card in the Main Steam and Feedwater Isolation System (MSFIS) control cabinet, the corrective action taken on the previous LER could not have prevented this event.

Event Two:

None.

Previous Occurrences (continued)

Event Three:

LER 88-012-00, transmitted on 11/10/88, via n NRC-1857.

During a 9/4/88 plant startup, the licensed operators concluded based on their review of surveillance tracking data, that OSP-AC-00004 was current

and not required for completion of plant startup. This missed surveillance was discovered on 10/14/88.

This event occurred as a result of the failure to incorporate into the surveillance tracking program, the requirement to perform OSP-AC-00004 on each startup if not performed within the previous seven days.

The 2 to 1 Mode Change Letter and the surveillance task sheets were revised to incorporate new TOPRP requirements. The appropriate individuals were counseled with respect to their involvement in this event.

Although LER 88-012-00 and LER 90-007-00 are similar in that each detail a missed surveillance from procedure OSP-AC-00004, the correction action taken on the previous LER could not have prevented this event.

Footnotes

The system and component codes below are from the IEEE Standards 805-1983 and 803A-1983, respectively.

1. System - JC
2. System - SB, Component - ISV
3. System - JE
4. System - AA, Component - ROD
5. System - JC, Component - BKR
6. System - IB, Component - ANN
7. System - AA, Component - CAB
8. System - TB, Component - BRK
9. System - SB, Component - CAP
Manufacturer - Consolidated Controls, Corp.
10. System - SB/SJ, Component - CAB
11. System - AA, Component - CTR
12. System - SJ, Component - ISV

July 10, 1990

U. S. Nuclear Regulatory Commission
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ULNRC-2247

Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 90-007-00
TWO REACTOR TRIPS DUE TO FAILED INPUT BUFFER CARD
AND FAULTY SLAVE CYCLER COUNTER CARD AND A
MISSED SURVEILLANCE DUE TO COGNITIVE PERSONNEL ERROR

The enclosed Licensee Event Report is submitted pursuant to 10 CFR 50.73(a)(2)(iv) concerning two reactor trips as a result of equipment failures and pursuant to 10CFR50.73(a)(2)(i)(B) concerning a missed surveillance due to cognitive personnel error.

J. D. Blosser
Manager, Callaway Plant

TPS/MKD/lrj

Enclosure

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Mr. A. Bert Davis Mr. Anthony T. Gody, Jr. (2 copies)
Regional Administrator Office of Nuclear Reactor Regulation
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